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(54) **Feeding arrangement for livestock**

(57) In an electronic sow feeding system, an enclosed area 14 is provided at the entry side to feed stations 20. Access to the enclosed area 14 is through a gate 36, and the gate 36 is only opened in response to the approach of an animal which is identified by the feeding system as having a feed balance to be consumed.

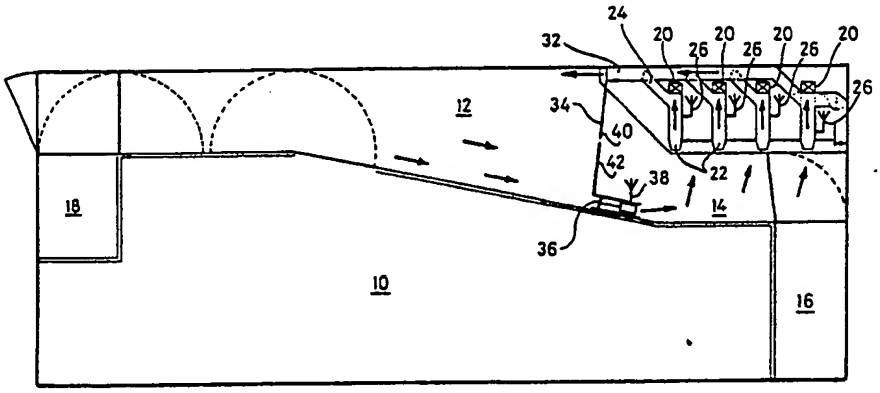

Fig. 1

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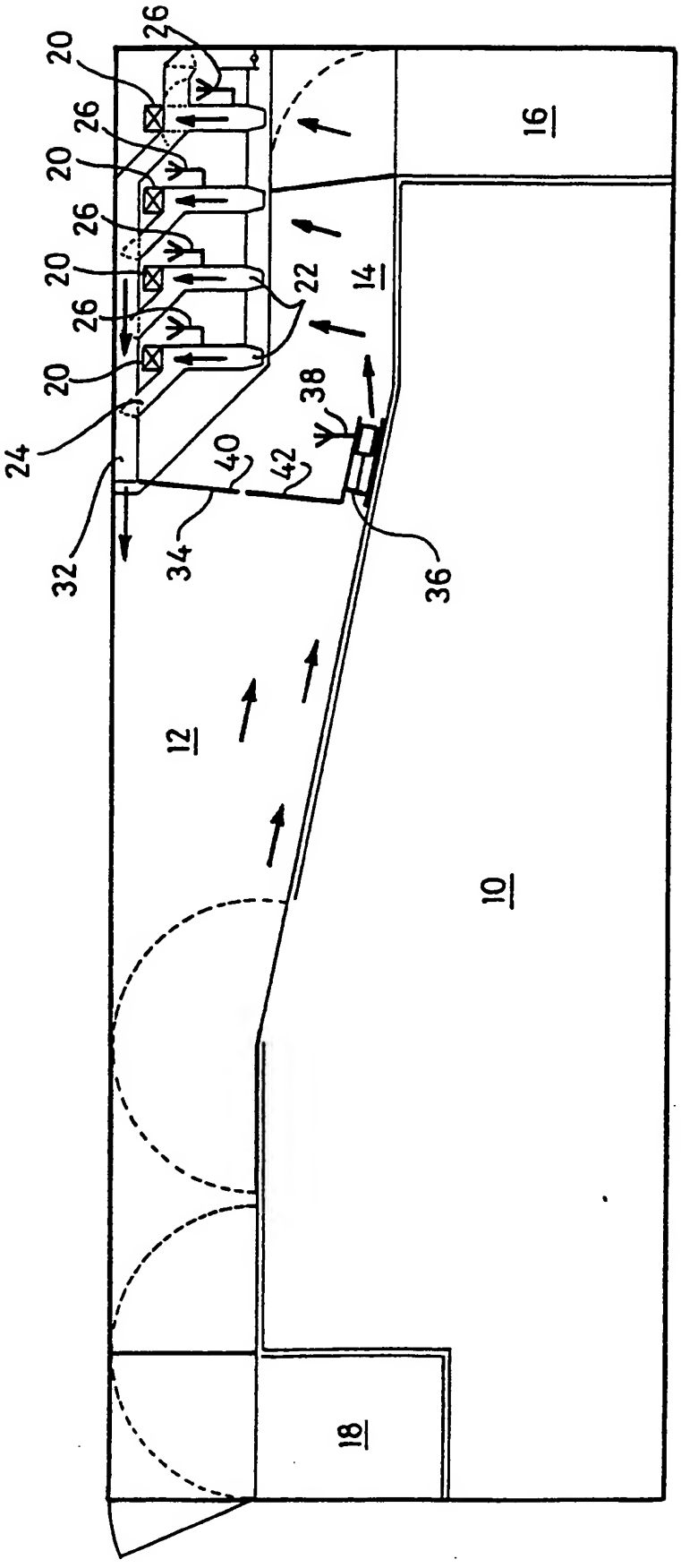

Fig. 1

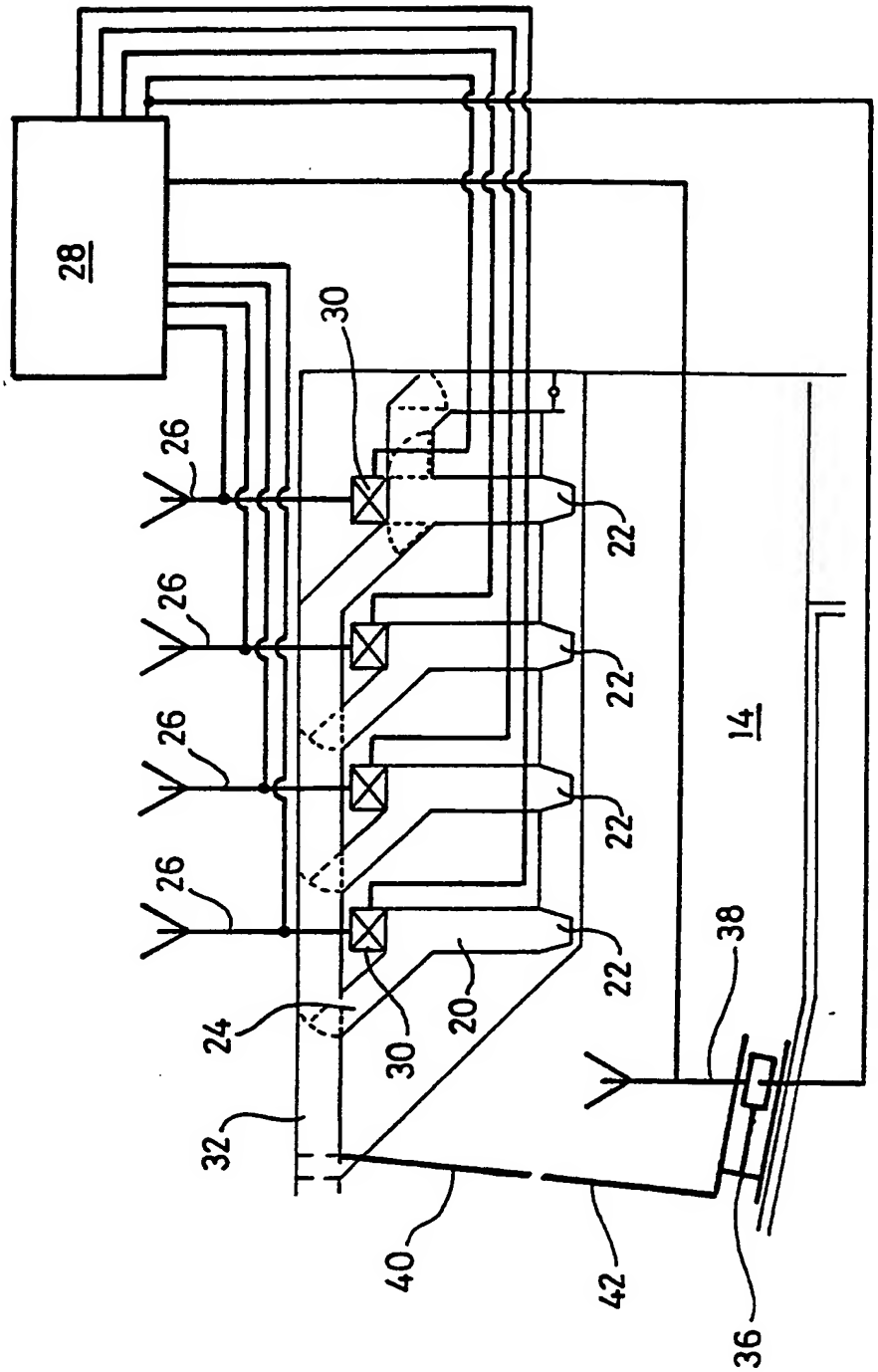

Fig. 2

Feeding Arrangement for Livestock

This invention relates to a feeding arrangement for livestock where movement of individual animals into a feeding area is controlled. The invention is particularly suitable for use in controlling the feeding of sows, but the invention is not restricted to this application.

Electronic sow feeding equipment is known where each animal wears or has attached to it some form of electronic device which allows the animal to be individually identified when in the vicinity of a receiver aerial. These devices may be transponders or responders and include collars, ear tags and implanted devices. For the purposes of this specification, such systems will be referred to as electronic tagging systems, and the term "electronic tag" will include any device carried by an animal for interaction with a receiver aerial, whether this is an ear tag, a collar, an implanted device or any other form or location of device. The receiver aerial is associated with a feed station, and the amount of food available to each animal in a given (eg 24 hour) period can be preset to an individual level for the animal. When a particular animal enters the feed station, the feed station will make available the particular quantity of food allocated to that animal, and if the animal takes only part of the allocated quantity, then this will be remembered and the animal can come back for the balance of its feed at a later time.

The animals which do not take the whole of their allocated quantity at once are likely to be the weaker animals, and it is desirable to ensure that these weaker animals are not prevented or inhibited from returning to feed by stronger animals congregating around the feed stations.

According to the invention, there is provided a feeding arrangement for feeding livestock which are individually identifiable through an electronic tagging system, the arrangement comprising at least one feeding station which has an entrance and an exit and at which an animal can receive food with the amount of food each animal can receive being controlled for that animal, an enclosed area adjacent to the entrance to the or each feed station, a barrier separating the enclosed area from a general livestock accommodation area, and a gate in the barrier, the gate being controlled electronically so that it can only be opened for an animal which is identified through the electronic tagging system as having an unconsumed feed balance.

With this arrangement, those animals which have consumed all of their feed are kept away from the area of the feeding stations by the barrier, and cannot pass through the gate. However the animals which have not consumed all their feed, ie animals which have a feed balance, can pass through the gate and can receive the rest of their feed.

The feed station can be any suitable type which dispenses food, on demand by the animal, up to an electronically controlled maximum for each individual animal.

The gate may be controlled by an additional feed mechanism, of the same type as the feed mechanisms used at the feeding stations, but set so that when an animal with a feed balance is in the vicinity of the station, a mechanical component moves to release the gate and the station notionally dispenses a very small quantity of food, say one gram, which will have no substantial effect on the quantity of food available to that animal.

There are preferably a plurality of feeding stations, and the exit from each station communicates with the general livestock accommodation area. In particular, the barrier may separate the enclosed area from a dunging area, and the feeding station exits may lead into the dunging area.

The invention will now be further described, by way of example, with reference to the accompanying drawings, in which

Figure 1 is a schematic plan view of a feeding arrangement in accordance with the invention; and

Figure 2 is an enlarged view of part of the arrangement of Figure 1.

Figure 1 shows a sow accommodation unit which is divided into a laying area 10, a dunging area 12 and an enclosed feed area 14. There are also smaller areas within the unit which form a training pen 16 and a gilt pen 18.

In the enclosed feed area 14 there are four feeding stations 20 each with an entrance 22 and an exit 24. Each feed station has an aerial 26.

In operation, an animal carrying an electronic tag which enters the entrance passage 22 will transmit or receive a signal which will be picked up by the corresponding aerial 26 and will be passed to a central processing unit 28. The CPU will then identify the animal and return a feed quantity signal to a feed dispenser 30 associated with that station. The feed dispenser will be of the type which requires actuation by the animal to actually dispense the feed into a trough from which it can be eaten, up to a maximum allowed by the CPU for that particular animal. The processor records how much feed is dispensed to the animal.

Some animals will take their full ration before leaving the feeding station. Others may take only part, in which case they must be able to return at another time to take the balance. After feeding, the animals leave the feeding station through the exit passages 24 and pass along a return passage 32 to the dunging area 12.

The dunging area 12 is separated from the enclosed area 14 by a barrier 34 which includes an electronically controlled gate 36. The gate 36 has an associated aerial 38, and is also connected into the CPU 28. When an animal approaches the gate 36, a signal is transmitted from the aerial 38 to the CPU to identify the animal. If the CPU identifies that animal as having an unconsumed balance of its food ration, then the gate will open. The gate may either open automatically, or be unlocked so that the animal can push past it. Once the animal has passed, the gate will close and lock again. If an animal which approaches the gate is identified as having consumed its full feed ration, then the gate will not open.

The barrier 34 is in the form of two hinged doors 40 and 42, and can be opened for cleaning purposes.

This arrangement helps to avoid aggressive behaviour on the part of the animals. Since an aggressive animal which has taken its full feed ration obtains no reward from pushing in the area of the gate 36, there is no incentive for this type of behaviour.

The gate 36 may be controlled by the same mechanism as used in the feeding station, so that mechanical movement in the mechanism which normally acts to dispense food is used to a different end to unlock the gate. Because the feeding mechanism only moves to dispense a specific quantity of food, the mechanism which controls the gate may be set so

that it notionally dispenses a minute quantity of food, thus allowing the computer to see the feed stations and the gate 36 in the same way.

Claims

1. A feeding arrangement for feeding livestock which are individually identifiable through an electronic tagging system, the arrangement comprising at least one feeding station which has an entrance and an exit and at which an animal can receive food with the amount of food each animal can receive being controlled for that animal, an enclosed area adjacent to the entrance to the or each feed station, a barrier separating the enclosed area from a general livestock accommodation area, and a gate in the barrier, the gate being controlled electronically so that it can only be opened for an animal which is identified through the electronic tagging system as having an unconsumed feed balance.

2. An arrangement as claimed in Claim 1, wherein the or each feed station is of a type which dispenses food, on demand by the animal, up to an electronically controlled maximum for each individual animal.

3. An arrangement as claimed in Claim 1 or Claim 2, wherein the gate is controlled by an additional feed mechanism, of the same type as the feed mechanisms used at the feeding stations, but set so that when an animal with a feed balance is in the vicinity of the station, a mechanical component moves to release the gate and the station notionally dispenses a very small quantity of food which will have no substantial effect on the quantity of food available to that animal.

4. An arrangement as claimed in any preceding claim, wherein there are preferably a plurality of feeding stations, and the exit from each station communicates with the general livestock accommodation area.

5. An arrangement as claimed in any preceding claim, wherein the barrier separates the enclosed area from a dunging area, and the feeding station exits lead into the dunging area.

6. A feeding arrangement for livestock, substantially as herein described with reference to the accompanying drawings.

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